SONY
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BVM-L / PVM-L Series

BVM-L231 / BVM-L170
Master Monitors

PVM-L3200 / PVM-L2300 / PVM-L1700
Broadcast Monitors

TRIMASTER

BVM-L and PVM-L Series
High-Precision Professional LCD Monitors

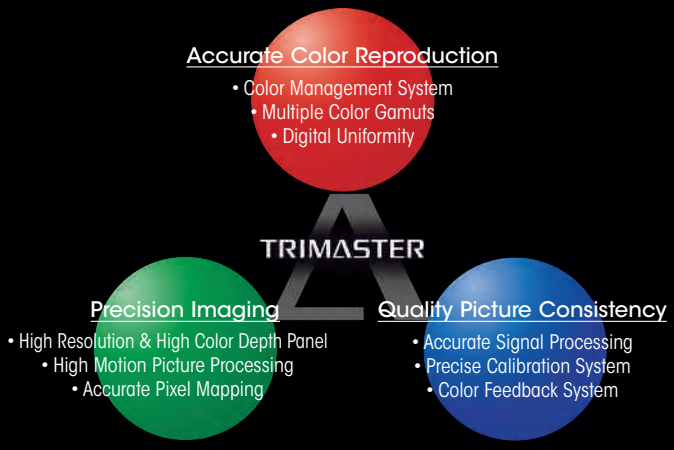
First came the legendary BVM and PVM Series Trinitron® monitors, which made Sony a fixture wherever broadcast and video professionals evaluated detail, color and tonal nuance. Next came TRIMASTER™ technology, the breakthrough that led to the first LCD monitors with the precision to merit the designation "BVM." Now you can choose from a complete family of models with TRIMASTER technology: the BVM-L Series master monitors and PVM-L Series broadcast monitors.

To create TRIMASTER technology, Sony's engineers scrutinized every basic specification one by one and invested creativity without compromise. These efforts have been recognized by dozens of patents and honored by international awards.

Endowed with TRIMASTER technology, BVM-L and PVM-L Series monitors incorporate a 12-bit display engine, 10-bit drive LCD panel, sophisticated nonlinear color management algorithms and advanced feedback stability systems. BVM-L models boast a backlight system with high-purity Red, Green and Blue LEDs, while PVM-L monitors use a wide color gamut cold cathode fluorescent backlight. The result? Ultimate LCD monitors with color reproduction, precision imaging, and uniformity as good as—and often better than—their legendary Trinitron® predecessors.

TRIMASTER Technology

Honored by multiple awards, the subject of dozens of patents, Sony TRIMASTER technology represents an exacting benchmark in LCD evaluation monitors. Here are superlative color accuracy, precision imaging and rock-solid consistency.



Three Secrets to Master Monitor Picture Quality

■ Sony-designed LCD Panels

At the heart of these monitors are Sony-designed LCD panels, based on our strict criteria and developed expressly for the BVM-L and PVM-L Series. They offer 10-bit panel drive; fast, 120 Hz refresh rates; wide viewing angles and high contrast.

■ Precision Backlight

A landmark technology exclusive to the BVM-L Series is Sony's precision backlight system, which uses Sony-designed Red, Green and Blue LEDs. This enables the widest color gamut ever offered in a Sony monitor, plus uniformity without precedent in an LCD monitor. The PVM-L Series incorporates a wide color gamut CCFL backlight system.

■ 12-bit Display Engine

Sony complements the LCD panels and backlight with a high-precision signal-processing engine. With 12-bit accuracy at the output of each process, the engine provides high-quality interlace-to-progressive (I/P) conversion, high-precision scaling and highly accurate color management.

BVM-L Series

BVM-L231

BVM-L170

Wherever professionals depend on the most honest, most revealing display of digital content, Sony BVM-L Series are the monitors of choice. They're the go-to tools for cinematographers, colorists, broadcast shaders and other demanding image professionals. They're measuring instruments that strictly comply with broadcast standards. And they support Digital Cinema with DCI color gamut emulation* and S-Log gamma inversion.

Thanks in part to Sony's high-purity RGB backlight, our BVM-L models can do what other LCD monitors can't: precisely match the color values of BVM Trinitron® CRT monitors. One BVM-L monitor on a wall will precisely match another. And the BVM-L monitor you see in the VFX house will precisely match the BVM-L monitor you'll see in the Digital Intermediate suite. It sounds so simple, but achieving this uniformity in LCD monitors requires amazing technology—technology found only in Sony's BVM-L Series.

*The chromaticity of SMPTE RP 431-2-2007 is not covered in full.

PVM-L Series

PVM-L3200

PVM-L2300

PVM-L1700

The PVM-L Series offers superb performance at reasonable cost. Optimized for broadcast and video production, PVM-L monitors enjoy many of the same TRIMASTER™ technologies and features as the BVM-L Series.

Features include the same 10-bit drive LCD panels and the same 12-bit display engine, mated to a Wide Color Gamut Cold Cathode Fluorescent (WCG CCFL) backlight system. Customized color filters and Sony's unique color management system empower the PVM-L monitors to cover the color gamut of the three industry standards (SMPTE-C, EBU, and ITU-R BT709).

Choose from 32-inch, 23-inch and 17-inch screens (viewable area measured diagonally). With this range, the PVM-L Series is fully qualified to replace CRT monitors in studios, editing suites, OB trucks, and in the field.

Feature Comparison

	BVM-L Series	PVM-L Series
	BVM-L231 (23")*1 BVM-L170 (17")*1	PVM-L3200 (32")*1 PVM-L2300 (23")*1 PVM-L1700 (17")*1
Devices		
10-bit full HD resolution LCD panel	O	O
Backlight	High-purity LEDs	Wide color gamut CCFL
Inputs		
3G/HD/SD-SDI input (four option slots)	O	O
HDMI input	O	O
DVI-D input	O	O
Color gamut and Color temperature		
Color gamut	SMPTE-C, EBU, ITU-R BT.709, **D-Cine***2, BVM-L Native	SMPTE-C, EBU, ITU-R BT.709, PVM-L Native
Color temperature	D65, **D93, D61, D56, D-Cine,** User 1 to 5	D65, D93, User 1 to 5
General features and functions		
Black frame insertion	O **(Backlight blinking)**	O
Interlace display	O	O
Picture & picture	O (Side-by-side, **Wipe, Butterfly, Blending**)	O (Side-by-side only)
Pixel zoom	O	O
HD Frame capture	O	O
Black detail mode	O	O
Aspect correction mode	O	O
+12dB chroma up function	O	O
Marker settings	O	O
Aspect switch	16:9 ⇔ 4:3, **16:9 ⇔ 2.39:1, 1.896:1 ⇔ 2.39:1**	16:9 ⇔ 4:3
Scan switch	O	O
Native scan	O	O
Auto white balance	O	O
Auto Chroma / Phase adjustment	O	O
Internal test signal	O	O
Copy function	O	O
Ethernet-based remote control (BKM-16R)	O	O
EIA 19-inch Rack Mount (6U Height)	O (BVM-L170 only)	O (PVM-L1700 only)
DC operation	O (BVM-L170 only)	O (PVM-L1700 only)
Film features and functions		
Digital cinema 2K (2048 x 1080) formats	**O**	–
2048 Image slide	**O**	–
S-Log gamma	**O**	–
Gamut error display	**O**	–
Film cadence	**O**	–

*1 Viewable area measured diagonally: PVM-L3200: 31.55-inches (801.3 mm)
BVM-L231/PVM-L2300: 22.5-inches (570.6 mm)
BVM-L170/PVM-L1700: 16.52-inches (419 mm)

*2 The chromaticity of SMPTE RP 431-2-2007 is not completely displayed.

Main Features

The BVM-L and PVM-L Series are built on the foundation of TRIMASTER™ technology, a comprehensive approach to ultimate picture fidelity in the age of LCD. Thanks to the performance of TRIMASTER engineering, BVM-L and PVM-L Series monitors not only achieve the quality of their legendary predecessors—the BVM-A and BVM-D Series Trinitron® monitors—but also add innovative features for today's needs.

Superb Picture Quality and Stable Color Temperature

■ Accurate Color Reproduction

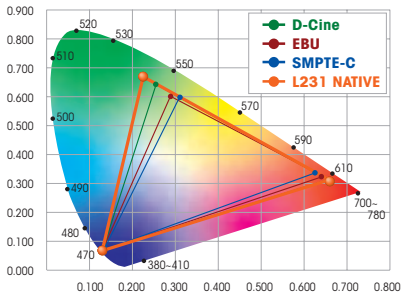
• Nonlinear Cubic Conversion Color Management System

A CRT monitor has a fixed color gamut, determined by the chemistry of the screen phosphors. In dramatic contrast, Sony BVM-L and PVM-L monitors offer a choice of color gamuts thanks to unique 3-D LUTs (look-up tables). The system begins with a reference file containing 10,000 measurements of the target gamut. We then measure each individual BVM-L and PVM-L panel. The 3-D LUTs meticulously map the panel's native gamut to the target gamut, achieving incredibly accurate tracking across the entire grayscale.

Accurate color management must be conducted in linear space. Sony de-gammas the signal prior to color management and applies high-precision S-curve re-gamma afterwards. Sony's Nonlinear Cubic Conversion also concentrates gradation values in the region where the human eye is most sensitive, increasing accuracy further still.

In this way, the monitors achieve phenomenal accuracy emulating EBU and SMPTE-C phosphors as well as the ITU BT.709 (sRGB) gamut. The BVM-L Series also provides a D-Cine* gamut, a wider color space valued in Digital Intermediate work.

* D-Cine emulates the color gamut described in SMPTE RP 431-2-2007. The chromaticity of the green-red region is not covered in full; however, the color shift in this region is subtle.



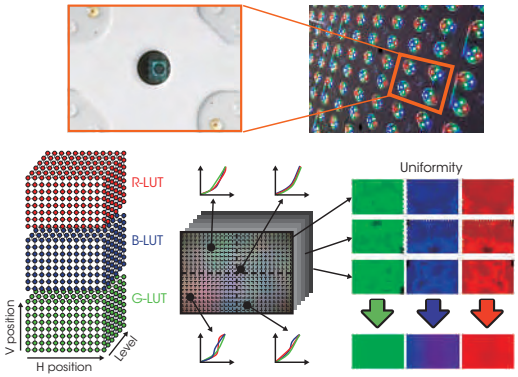
■ Ultra-Precise Uniformity Correction

BVM-L Series

Even LCD panels from the same manufacturing batch can exhibit a notable lack of uniformity—a fatal problem in color-critical evaluation monitoring. To make evaluation-grade LCD monitoring a reality, Sony engineers created the RGB backlight, an array of Sony-designed Red, Green and Blue LEDs. By adjusting backlight color and brightness for each region of the screen, Sony BVM-L monitors achieve superb uniformity.

At the factory, Sony measures each and every BVM-L panel for grayscale levels in several regions across the panel. Any variations are corrected using an RGB LUT (look-up table). A fluorescent backlight monitor must perform these corrections in the video signal, sacrificing precision. Sony's BVM-L monitors adjust the RGB backlight, retaining full signal precision.

In the field, alignment is maintained with an array of optical RGB sensors behind the LCD screen. If the sensors detect color or intensity drift, the system adjusts the backlight brightness and color balance. The result is amazing uniformity from corner to corner—and from year to year—making the BVM-L231 and BVM-L170 outstanding choices for the most critical evaluation of digital content.



■ Multiple Color Gamuts (SMPTE-C, EBU, ITU-R BT.709)

PVM-L Series

The PVM-L Series incorporates the same nonlinear cubic conversion color management system as the BVM-L Series. It uses a unique 3-D LUT (Look-up table) to reproduce precise color gamuts throughout the entire grayscale. Screen brightness is provided by a wide color gamut cold cathode fluorescent backlight (WCG-CCFL). While all WCG-CCFLs provide wide color gamuts, not all are compatible with broadcast color gamuts. The WCG-CCFL backlight of the PVM-L Series is carefully designed to emulate BVM-CRT phosphors. Together with Sony's unique color management system, this enables the PVM-L Series to accurately reproduce color gamuts such as SMPTE-C, EBU, and ITU-R BT.709. Unlike CRT monitors, which offer only one color gamut per model, the PVM-L Series allows these color gamuts to be selected and reproduced on the same monitor–a feature made possible only by Sony's unique technology.

With the PVM-L Series, white is reproduced uniformly right across the screen. At the factory, Sony measures each and every PVM-L panel for grayscale levels in several regions across the panel. Any variations are corrected using an RGB LUT (look-up table).

■ Precision Imaging

• Full HD Panel with 10-bit Driver

The BVM-L and PVM-L Series both achieve high resolution and stunning color depth using a full-HD 1920 x 1080* LCD panel and precise 10-bit driver.

* The BVM-L231 and PVM-L2300 achieve 1920 x 1200 resolution.

• Exclusive I/P Conversion Technology

The BVM-L and PVM-L Series use a Sony interlace-to-progressive (I/P) conversion algorithm that increases accuracy, decreases conversion errors and holds picture delay to less than one field.

■ Picture-quality Consistency

• 12-bit Display Engine

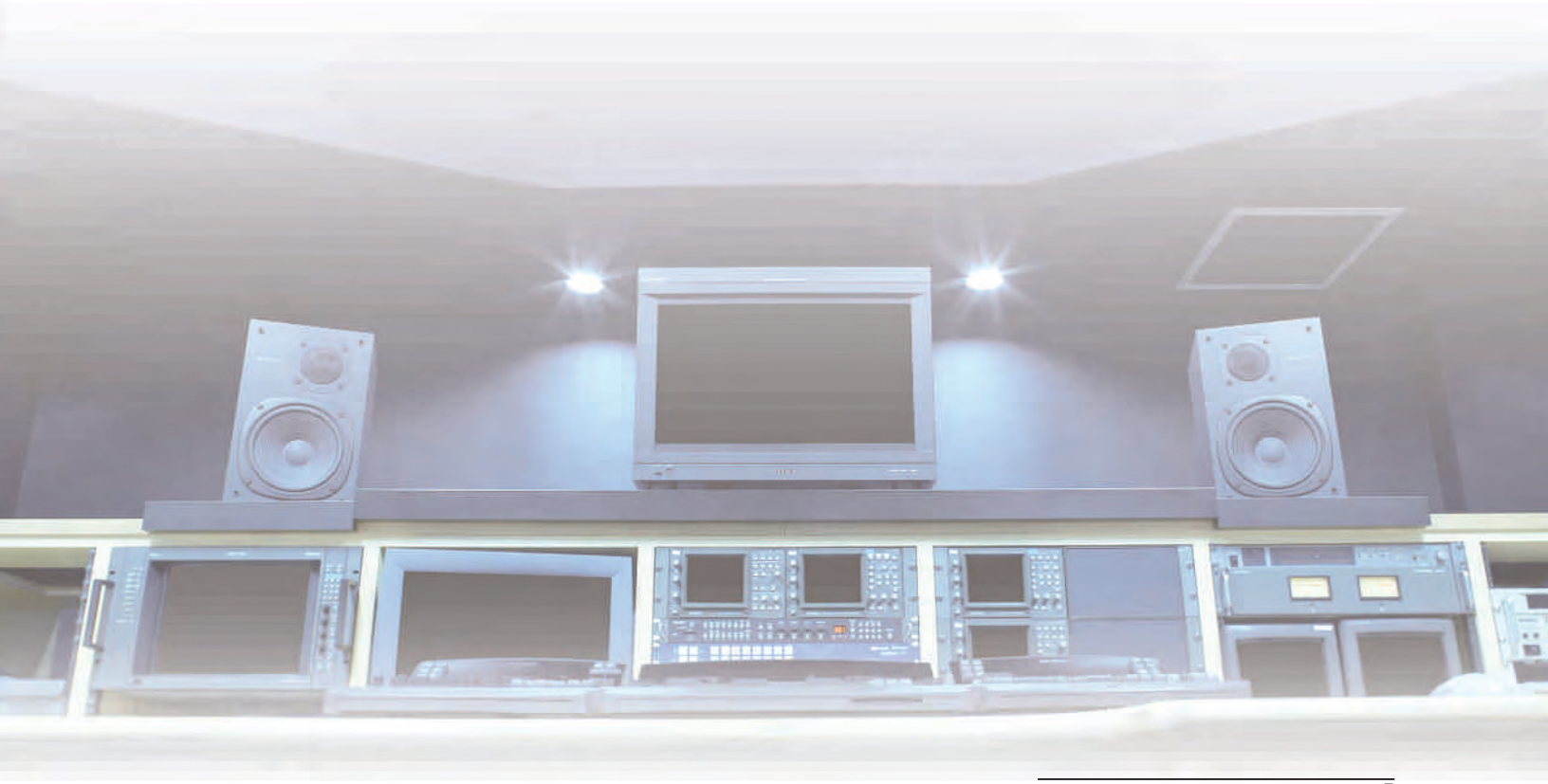
The display engine delivers exceptional 12-bit output accuracy for each color process, the precision needed for accurate image evaluation and manipulation.

• Panel Calibration

Sony calibrates each and every BVM-L and PVM-L Series monitor at the factory for extremely accurate characteristics such as gamma and uniformity.

• Color Feedback System

Thanks to Sony's RGB sensing and color feedback system, these monitors achieve the stability required for broadcast and evaluation.



Multi-format Signal Support

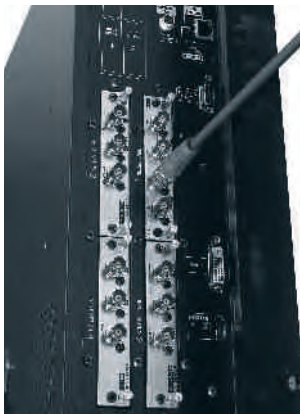
■ Input Versatility

Both BVM-L and PVM-L Series monitors accept almost any SD or HD video format, analog or digital, plus PC signals from VGA to WUXGA (1920 x 1200)[1]. In addition to standard DVI-D and HDMI™ interfaces, four option board slots can configure the monitors according to your specific needs. The optional analog interfaces accept composite, Y/C, Y/Cb/Cr, and RGB.

Digital interfaces accept SD-SDI, HD-SDI, Dual-Link HD-SDI, and 3G-SDI inputs. Acceptable signal formats include 525/60i, 625/50i, 525/60p, 625/50p, 720/50p and 720/60P, 10-bit/12-bit RGB 4:4:4 1080/24PsF, 1080/24p, 1080/25PsF, 1080/25p, 1080/50i, 1080/30PsF, 1080/30P and 1080/60i, 10-bit 4:2:2 1080/50p and 1080/60p, and the digital cinema formats of 12-bit 4:4:4 RGB/XYZ 2048 x 1080/24PsF and 2048 x 1080/24p.[2]

1. BVM-L170, PVM-L3200, and PVM-L1700 monitors can accept PC signals up to full HD (1920 x 1080).

2. Only the BVM-L Series accepts 2048 digital cinema signal formats.



BVM-L231 with the optional BKM-250TG 3G-SDI board

● 3G-SDI Interface

The latest 3G-SDI interface enables a single SDI cable to transmit signals up to 10-bit 4:2:2 1080/60p. This offers a simple cabling solution behind rack-mounted equipment in editing rooms and sub-control rooms. Both the BVM-L and PVM-L Series accommodate 3G-SDI sources with the optional BKM-250TG 3G-SDI interface board, which supports the SMPTE 425 standard.

BVM-L and PVM-L Series Acceptable Signal Formats

NO	System Nomenclature	Samples per active line	Active lines per frame	Frame Rate fV (Hz)	Interface sampling freq (MHz)	Samples per active line	Total lines per frame	Line Frequency fH (kHz)	Standard
1	525/59.94i	720	487	59.94	13.5	858	525	15.73	Rec.ITU-R BT.601
2	625/50i	720	576	50	13.5	864	625	15.63	Rec.ITU-R BT.601
3	525/59.94p	720	483	59.94	27	858	525	31.47	SMPTE 293M/Rec.ITU-R BT.1358
4	625/50p	720	576	50	27	864	625	31.25	Rec.ITU-R BT.1358
5	1920 x 1080/24PsF*1	1920	1080	48/47.95	74.25 74.25/1.001	2750 2750	1125	27.00	SMPTE RP 211
6	1920 x 1080/24p*1	1920	1080	24/23.97	74.25 74.25/1.001	2750	1125	27.00	SMPTE 274M
7	1920 x 1080/25PsF	1920	1080	50			1125	28.13	RP 211
8	1920 x 1080/25p	1920	1080	25	74.25	2640	1125	28.13	SMPTE 274M
9	1920 x 1080/50i	1920	1080	50	74.25	2640	1125	28.13	SMPTE 274M
10	1920 x 1080/30PsF*1	1920	1080	60/59.94			1125	33.75	RP 211
11	1920 x 1080/30p*1	1920	1080	30/29.97	74.25 74.25/1.001	2200	1125	33.75	SMPTE 274M
12	1920 x 1080/60i*1	1920	1080	6/59.94	74.25 74.250/1.001	2200 2200	1125	33.75	SMPTE 274M
13	1280 x 720/24p*1	1280	720	24/23.97	74.25 74.25/1.001	4125	750	18.00	SMPTE 296M
14	1280 x 720/25p	1280	720	25	74.25	3960	750	18.75	SMPTE 296M
15	1280 x 720/30p*1	1280	720	30/29.97	74.25 74.25/1.001	3300	750	22.50	SMPTE 296M
16	1280 x 720/50p	1280	720	50	74.25	1980	750	37.50	SMPTE 296M
17	1280 x 720/60p*1	1280	720	60/59.94	74.25 74.250/1.001	1650 1650	750	45.00	SMPTE 296M
18	1920 x 1080/50p	1920	1080	50	148.5	2640	1125	56.25	SMPTE 274M
19	1920 x 1080/60p*1	1920	1080	60/59.94	148.5 148.5/1.001	2200	1125	67.50	SMPTE 274M
20	2048 x 1080/24PsF*1*2	2048	1080	48/47.95	74.25 74.25/1.001	2750	1125	27.00	
21	2048 x 1080/24p*1*2	2048	1080	24/23.97	74.25 74.25/1.001	2750	1125	27.00	

*1 Also compatible with 1/1.001 frame rates.

*2 BVM-L Series only supports 2048 digital cinema signal formats.

■ Flexible Input Configuration

Like BVM-A Series CRT monitors, BVM-L and PVM-L Series monitors offer modular slots, so inputs can be customized according to your needs. Four input board slots are available. You can install any optional input board* in any slot, in almost any combination, for easy configuration and superb cost-per-input value. For maximum flexibility, each option board occupies just one slot, so up to four boards can be installed simultaneously.

* BVM-L and PVM-L Series input boards are not compatible with other earlier BVM-A or BVM-D Series CRT monitors.

Input Board Slots

Interface Chart by Input Boards

Input Signal \ Board	System Nomenclature	Signal Format	BKM-220D	BKM-227W	BKM-229X	BKM-243HS*3	BKM-244CC*3	BKM-250TG*3
Analog Input	525/59.94i	Composite, Y/C (NTSC/PAL/PAL-M/SECAM)		●				
	625/50i			●				
	525/59.94i	Y/PB/PR, RGB		●				
	625/50i			●				
	1080/24Psf*2				●			
	1080/24p*2				●			
	1080/50i (25PsF)				●			
	1080/25p				●			
	625/50p				●			
	525/59.94p				●			
	1080/60i (30PsF)*2				●			
	1080/30p*2				●			
	720/50p				●			
	720/60p*2				●			
SD-SDI	525/59.94i	Y/PB/PR	●			●	●	●
	625/50i		●			●	●	●
HD-SDI	1080/24PsF*2	10bit 4:2:2 Y/PB/PR				●	●	●
	1080/25PsF					●	●	●
	1080/30PsF*2					●	●	●
	1080/50i					●	●	●
	1080/60i*2					●	●	●
	1280 x 720/60p*2					●	●	●
	1280 x 720/50p					●	●	●
Dual-Link HD-SDI	1080/24PsF*2	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/24p*2					●*1	●*1	●*1
	1080/25PsF	10bit 4:4:4 Y/PB/PR, RGB				●*1	●*1	●*1
	1080/25p	12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/30PsF*2	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/30p*2	12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/50i	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 RGB				●*1	●*1	●*1
	1080/60i*2					●*1	●*1	●*1
	1080/50p	10bit 4:2:2 Y/PB/PR				●*1	●*1	●*1
	1080/60p*2	10bit 4:2:2 Y/PB/PR				●*1	●*1	●*1
	2048 x 1080/24PsF*2 *5	12bit 4:4:4 XYZ 10bit/12bit 4:4:4 RGB				●*1	●*1	●*1
	2048 x 1080/24p*2 *5					●*1	●*1	●*1
3G-SDI	1080/24PsF*2 *4	10bit 4:4:4 Y/PB/PR, RGB 12bit 4:4:4 Y/PB/PR, RGB						●
	1080/25PsF*4							●
	1080/30PsF*2 *4							●
	1080/24p*2 *4							●
	1080/25p*4							●
	1080/30p*2 *4							●
	1080/50i*4							●
	1080/60i*4							●
	1080/50p	10bit 4:2:2 Y/PB/PR						●
	1080/60p*2							●
	1280 x 720/24p*2 *4	10bit 4:4:4 Y/PB/PR, RGB						●
	1280 x 720/25p*4							●
	1280 x 720/30p*2 *4							●
	1280 x 720/50p*4							●
	1280 x 720/60p*2 *4							●
	2048 x 1080/24PsF*2 *4 *5	10bit 4:4:4 RGB						●
	2048 x 1080/24p*2 *4 *5	12bit 4:4:4 RGB, XYZ						●
Number of digital inputs			2	–	–	2	2	2
Number of analog inputs			–	1	1	–	–	–

*1 Two BKM-243HS or BKM-244CC, or one BKM-250TG optional boards are used. *2 Also compatible with 1/1.001 frame rates. *3 BKM-243HS, BKM-244CC and BKM-250TG automatically detect SD-SDI and HD-SDI input signals. *4 Untested *5 BVM-L Series only supports 2048 digital cinema signal formats.

HDMI/DVI-D Input Signal Formats

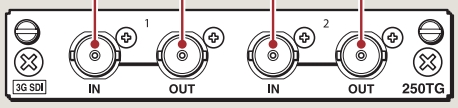
System	Interface sampling freq (MHz)	Aspect Ratio	Standard	HDMI RGB 4:4:4 8/10/12 bit YCbCr 4:4:4 8/10/12 bit YCbCr 4:2:2 12 bit	DVI-D Single Link RGB 4:4:4 8 bit
Viedo Signals					
640 x 480/60p*	25.200*	4:3	CEA-861	○	○
720 x 480/60p*	27.027*	4:3/16:9		○	○
1280 x 720/60p*	74.250*	16:9		○	○
1920 x 1080/60i*	74.250*	16:9	CEA-861	○	○
		2.39:1			
720 (1440) x 480/60i*	27.027*	4:3/16:9	CEA-861	○	○
720 x 576/50p	27.000*	4:3/16:9		○	○
1280 x 720/50p	74.250	16:9		○	○
1920 x 1080/50i	74.250	16:9	CEA-861	○	○
		2.39:1			
720 (1440) x 576/50i	27.000	4:3/16:9	CEA-861	○	○
1920 x 1080/60p*	148.500*	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/50p	148.500	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/24p*	74.250*	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/25p	74.250	16:9	CEA-861	○	○
		2.39:1			
1920 x 1080/30p*	74.250*	16:9	CEA-861	○	○
		2.39:1			
Computer Signals					
800 x 600/60p	40.000	4:3	VESA	○	
1024 x 768/60p	65.000	4:3		○	
1280 x 960/60p	108.000	4:3		○	
1280 x 1024/60p	108.000	5:4		○	
1400 x 1050/60p	121.750	4:3		○	
fH:28-75 kHz, fV:48-85 Hz Max. res.: 1920 x 1080/60p	25.000-162.000				○

* Also compatible with 1/1.001 frame rates.

■ Signal-interface Options

BKM-250TG, 3G/HD/SD-SDI Input Adaptor*

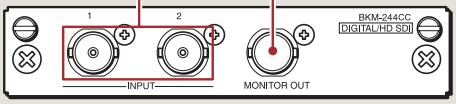
- 3G/HD/SD-SDI signal input (x2)
- 3G/HD/SD-SDI monitor output (x2)



* 3G-SDI, HD-SDI and SD-SDI signals are detected automatically

BKM-244CC, HD/SD-SDI Closed Caption Adaptor*

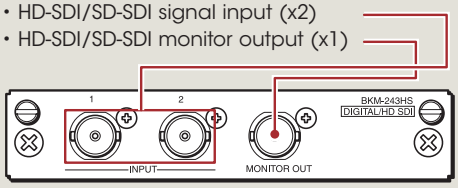
- HD-SDI/SD-SDI signal input (x2)
- HD-SDI/SD-SDI monitor output (x1)



* HD-SDI and SD-SDI signals are detected automatically
* Closed-caption decoders (EIA 608 and EIA 708) are equipped

BKM-243HS, HD-SDI/SD-SDI Input Adaptor*

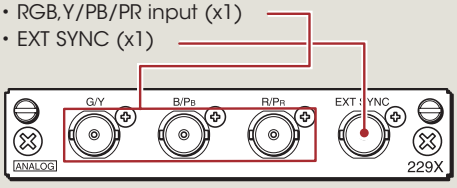
- HD-SDI/SD-SDI signal input (x2)
- HD-SDI/SD-SDI monitor output (x1)



* HD-SDI and SD-SDI signals are detected automatically

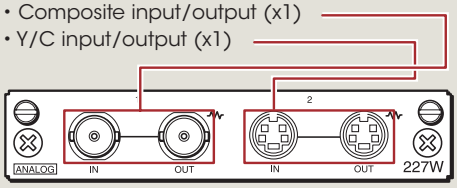
BKM-229X, Analog Component Adaptor

- RGB,Y/PB/PR input (x1)
- EXT SYNC (x1)



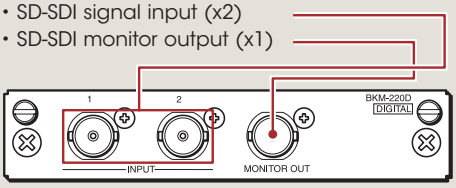
BKM-227W, NTSC/PAL Input Adaptor

- Composite input/output (x1)
- Y/C input/output (x1)



BKM-220D, SD-SDI 4:2:2 Input Adaptor

- SD-SDI signal input (x2)
- SD-SDI monitor output (x1)



Operational Convenience

Thanks to Sony's flat-panel technologies, the BVM-L and PVM-L Series monitors offer unique operating features. These monitors also benefit from the acclaimed functions and operational conveniences of their predecessors, BVM-A Series and BVM-D Series CRT master monitors. In addition, the BVM-L170 and PVM-L1700 incorporate a robust protection panel and offer a DC power option, crucial advantages for monitoring in the field.

Powerful Display Modes

Most flat-panel monitors can only display progressive images at the input signal's frame rate. The BVM-L and PVM-L Series go further, with two remarkable display options: Black Frame Insertion and Interlace Display.

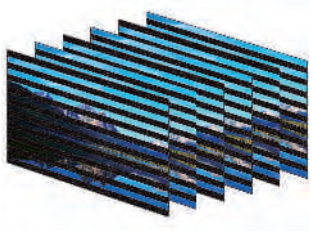
■ Black Frame Insertion

Motion blur is a characteristic inherent in LCD panels. Sony fights motion blur with unique Black Frame Insertion technology. This takes advantage of frame rates up to 120 Hz to dramatically reduce blur. In the BVM-L231 and BVM-L170, Black Frame Insertion takes the form of backlight blinking. This is different from the dynamic backlights of consumer televisions, which vary light level according to the average picture level. Blinking turns the backlight completely off for black frames, minimizing black level rise in dark portions of the image.

100/120Hz
Black Frame
Insertion Display

■ Interlace Display

Conventional LCD monitors can only convert interlace signals to progressive scan. In Interlace Display mode, the BVM-L and PVM-L Series emulate a CRT monitor, displaying interlace signals as interlace fields. When your application requires it, you get faithful reproduction of the interlace signal, free from I/P conversion artifacts.

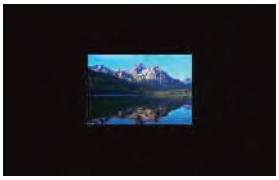


100/120Hz
Interlace Display

Native Scan (pixel-to-pixel display)

Conventional flat-panel monitors routinely scale incoming images to the native pixel count of the panel and routinely convert interlace signals to progressive. Sony's unique Native Scan function reproduces images without changing the input signal's pixel count. For example, Native Scan will reproduce a 525/59.94i SD signal at the native picture size of 720 x 487 pixels. As an option, the monitor can double this input to 1440 x 974 by duplicating each pixel both horizontally and vertically.

1920 x 1080 Native Scan



720 x 487 Native Scan

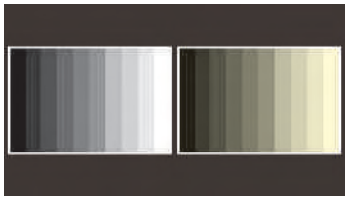
1440 x 974 Native Scan
(720 x 487) x 2

Picture & Picture

The unique Picture & Picture function of the BVM-L and PVM-L Series allows simultaneous display of two input signals. This function makes it easy to adjust two input sources—no need to compare two monitors. This function also comes in handy for adjustments between two cameras, special-effects creation, time-lapse shooting, and computer-generated graphics. The BVM-L Series provides four Picture & Picture modes, while the PVM-L Series offers one.

■ Side by Side

The two picture images are downscaled using a digital filter and displayed side by side. This feature is convenient for white balance adjustments or selecting shooting angles between two cameras.



■ WIPE

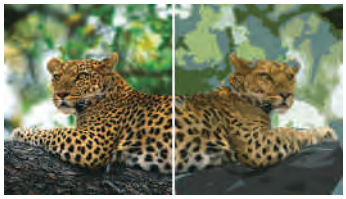
BVM-L only

You can vary the area of each picture with a vertical WIPE pattern, which you control from the BKM-16R. This function is useful when you need to compare pixel-by-pixel detail of two images. WIPE is especially handy for reviewing still images.

■ Butterfly

BVM-L only

You can display the two inputs as line-symmetric images on the left and right halves of the screen. With the H-position controller, you can move the two images inward to the middle of the screen. Then it's easy to make an instant comparison without moving your eyes.



■ Blending

BVM-L only

You can superimpose the two images and adjust the mix ratio. It's perfect for keying, to verify that foreground accurately matches the background, or when shooting live action to be composited with computer-generated effects.

Pixel Zoom

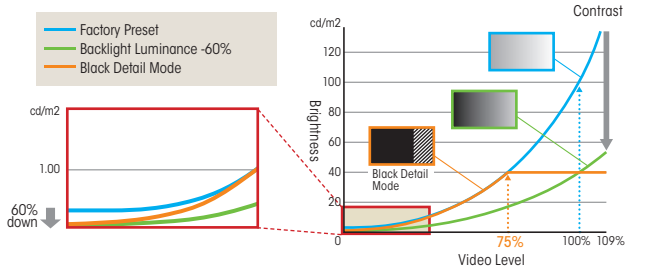
In Native Scan mode, you can magnify a selected area up to eight times and examine it on a pixel basis. This function does not use scaling. The desired picture content is enlarged and displayed faithfully to the raw input signal. Pixel Zoom is ideal for evaluating picture edges, such as for chroma keying.

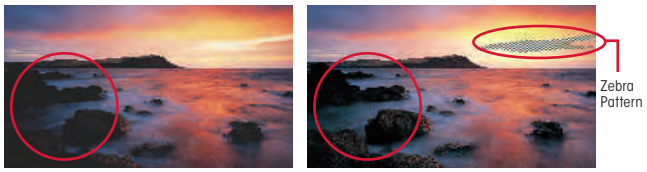
HD Frame Capture

You can save a video frame onto Memory Stick® media using HD Frame Capture. The picture file is a ready reference for matching color, exposure or camera framing from shot to shot. The monitors support full-size Memory Stick, Memory Stick Duo™ and Memory Stick PRO Duo™ media without an adaptor.

Black Detail Mode

LCD panels can reduce but not eliminate backlight leakage into dark areas of the screen. When the average picture level (APL) is low, you may prefer to use Sony's Black Detail mode. This reduces black level to 40% of normal while maintaining gamma for correct color and gradients. Because video levels higher than 75% are clipped, you can indicate this clipping by zebra pattern.

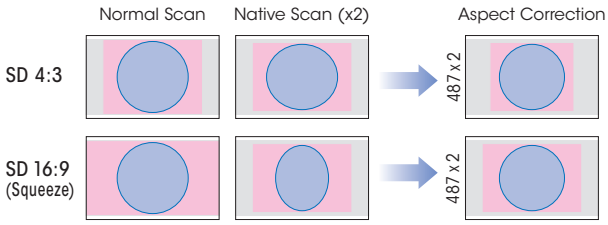




Normal Mode | Black Detail Mode

Aspect Correction Mode

A subtle difference between digital SD and HD signals is the shape of their pixels. While HD uses square pixels, SD signals under ITU-R BT.601 use slightly non-square pixels. Aspect Correction mode overcomes this difference and presents SD images with the correct geometry. It also applies the appropriate scaling algorithm depending on the SD video format, NTSC or PAL. You can simultaneously use Aspect Correction and Interlace Display mode to reproduce familiar-looking SD images.



Example of NTSC signal on the 16:10 aspect panel - BVM-L231

Gamut Error Display

Traditionally, it took a waveform monitor to alert you to "illegal" or out-of-gamut colors. Now the BVM-L231 and BVM-L170 master monitors have Gamut Error Display, which indicates out-of-gamut color with a zebra pattern over the relevant area of the picture. You can choose to highlight non-standard input signals or video signals exceeding the video level. These are generated during signal conversion from HD component to RGB.

S-LOG Gamma

BVM-L only

Sony's most advanced digital cinematography cameras incorporate S-LOG gamma, an option that enables the full latitude of the camera CCD to be maintained throughout the production chain. Unlike conventional systems, in which highlights are compressed, S-LOG Gamma logarithmically converts the video signal using characteristics similar to film negatives. This keeps the camera CCD dynamic range intact, even in extreme highlights. Both the BVM-L231 and BVM-L170 incorporate gamma tables that correctly invert the camera's S-LOG gamma signals. The monitors offer two display modes.

1) S-LOG Full

To monitor highlight clipping, this displays the full dynamic range of the video signal captured from Sony's digital cinematography cameras.

2) S-LOG Standard

This mode is optimized for monitoring signals under 65% video level, for accurate color reproduction of flesh tones and shadows. Higher exposure levels are clipped.

2048 Image Slide

BVM-L only

In Normal Scan modes, digital cinema 2K material fits completely on the monitor screen. In Native Scan mode, 2K material can occupy up to 2048 x 1080 pixels, slightly exceeding the screen. 2048 Image Slide lets you shift the image to display the left or right edges while enjoying full, pixel-to-pixel mapping.

"+12dB Chroma UP" Function

You can boost the chroma level by 12 dB using the "Chroma UP" button on the BKM-16R. This helps your camera operators adjust white balance with a higher degree of accuracy.

Marker Settings

Like the earlier BVM Series CRT monitors, BVM-L and PVM-L Series monitors give you a choice of on-screen markers, including an aspect marker (lines or aspect blanking), safe area marker, and center marker (long or short types). You can adjust the aspect marker for color, brightness, horizontal/vertical position and width. You can control the height and width of safe area markers. You can even display two safe area markers, each with three marker variations. These markers complement a full range of shooting scenarios from SD/HD video acquisition to digital cinematography*.

* PVM-L Series monitors support only 16:9 and 4:3 aspect markers.

Marker Variation

	Safe Area Marker		Aspect Marker*
	%	Dot (Pixel)	
Selectable Markers	80%, 88%, 90%, 93%, or variable	Flexible	16:9, 15:9, 14:9, 13:9, 4:3, 2.39:1, 2.35:1, 1.896:1. 1.85:1, or 1.66:1
Line Colors	White, Red, Green, Blue, Yellow, Cyan, or Magenta		
Line Width	Thick or Thin		
Line Luminance	90 IRE or 40 IRE		

* The PVM-L Series supports 16:9 and 4:3 only

Scan Switch

You can choose from 5% blanking (which emulates over-scan by displaying 95% of the picture), 0% and -3% Under Scan.

DC Battery Operation

The BVM-L170 and PVM-L1700 can be powered by either AC or DC. With their light weight, small size, and height comparable to 14-inch BVM-CRT monitors, the BVM-L170 and PVM-L1700 are ideal for field and OB van applications.

Marker Examples

Screen Size: 16:9,
Aspect Mode: 2.35:1*,
Aspect Marker Color:Magenta,
Marker Bright: 90IRE,
Width: THICK,
Safe Area: Shape A,
Area Size: 80%,
Center Marker: Short,
Aspect Blanking: Off

*BVM-L Series only support 2.35:1 aspect.

Screen Size: 16:9,
Aspect Mode: 14:9*,
Aspect Marker Color: Yellow,
Marker Bright: 40IRE,
Width: THIN,
Safe Area: Shape B,
Area Size 80%,
Center Marker: Short,
Aspect Blanking: HALF

*BVM-L Series only support 14:9 aspect.

Screen Size: 16:9,
Aspect Mode: 4:3,
Aspect Marker Color: Green,
Marker Bright: 90IRE,
Width: THICK,
Safe Area: SHAPE C,
Area Size: 80%,
Center Marker: LONG, Aspect Blanking: BLACK

Robust Protection Panel

The BVM-L170 and PVM-L1700 include a robust protection panel, standard. The BVM-L231 and PVM-L2300 accept the optional BKM-23M protection panel. This recommended accessory is easy to attach and detach.

The BVM-L231 with
the optional BKM-23M Protection Panel
The BKM-23M can also be attached to the PVM-L2300.

Modular Monitor Control Unit (BKM-16R)

Like earlier BVM Series CRT monitors, these monitors and their control panels are sold as separate units, enabling flexible system design. The BVM-L and PVM-L Series work with the optional BKM-16R monitor control unit, which offers 16 assignable function keys. You can attach the BKM-16R beneath the BVM-L231, BVM-L170, PVM-L2300, and PVM-L1700 monitors using the optional controller attachment stand* or connect the BKM-16R remotely via Ethernet.

* The BVM-L231 uses the BKM-37H Attachment Stand. The PVM-L2300 uses either the BKM-37H or BKM-38H.

The BVM-170 monitor and the BKM-16R controller attached with the BKM-39H Attachment Stand.

The BVM-L231 monitor and the BKM-16R controller attached with the BKM-37H Attachment Stand.

Ethernet-based Remote Control

The BVM-L and PVM-L Series monitors and the BKM-16R monitor control unit are each equipped with an Ethernet port. So you can control the monitors remotely across a standard Ethernet connection. One BKM-16R can control up to 32 monitors, including BVM-L, PVM-L and older BVM-A Series models.

Copy Function

You can save and load setup data using the Memory Stick™ slot[1] of the optional BKM-16R control unit. So it's easy to load the same setup onto each unit in a multi-monitor system.[2] You can also transfer setup data via the monitor's Ethernet connection.

1. Both standard-size Memory Stick media and the smaller Memory Stick Duo and Memory Stick PRO Duo media can be used. A Memory Stick Duo adaptor is not required.

2. Data can be moved between BVM-A, BVM-L, and PVM-L monitors.

BKM-16R Monitor Control Unit

Front Panel

Rear Panel

Easy Setup and Adjustment

Auto White Balance

You can automatically adjust the color temperature and white balance of BVM-L and PVM-L Series monitors using the Auto White Balance function and specified color temperature probes.* These include the Konica Minolta CA-210, DK-Technologies PM5639/06, and X-Rite i1 (Eye-One) Pro.

* A connector is required for each color analyzer.

Auto Chroma/Phase Adjustment

For analog signal inputs, an Auto Chroma/Phase/Matrix setup function automatically adjusts the monitor using external color bars.

Internal Test Signal and SMPTE Color Bars

A library of built-in test signals includes 100% white, 20% gray, 0% black, PLUGE (Picture Line Up Generating Equipment), color bars, 5-step grayscale, and ramp signals.

"Character Off" Button (BKM-16R)

To facilitate parameter adjustments, the BKM-16R control unit generates convenient On-Screen Menus, which be toggled on or off with a simple press of a button on the BKM-16R front panel.

Color Temperature Selection

The PVM-L Series gives you a choice of D65, D93 and User 1 to User 5 color temperature settings. The BVM-L Series includes all of these, plus D61, D56 and D-Cine (x=0.314, y=0.351). The BKM-16R Color Temp button gives you instant access to the Color Temp menu without using the On-Screen menu.

Aspect Switch

You can switch the aspect ratio among 4:3, 16:9, 2.39: 1*, and 1.896:1* depending on the input signal.

* Aspect ratios of 2.39:1 and 1.896:1 are supported by the BVM-L Series only.

16:9	⇔	4:3
16:9	⇔	2.39:1*
1.896:1	⇔	2.39:1*

* BVM-L Series only.

Other Features

- VESA™ Mounting (200 x 100 mm pitch) (BVM-L231, PVM-L3200, and PVM-L2300 only)
- 19-inch EIA Standard Rack Mountable (BVM-L170, PVM-L1700 only)
- Blue Only mode
- Monochrome mode
- H Delay/V Delay
- NTSC Setup Level (0%, 7.5%)
- Component Level (SMPTE/EBU-N10 or Betacam® system)
- Aperture
- Serial Remote (Ethernet)
- Parallel Remote (D-sub 9-pin)
- Tally Lamp (Amber)
- EXT Sync (for RGB/YUV)
- Remote Maintenance

The BVM-L231 with the BKM-37H Attachment Stand

Specifications

		BVM-L231	BVM-L170
PICTURE PERFORMANCE			
Type		a-Si TFT Active Matrix LCD	a-Si TFT Active Matrix LCD
Picture Size (Viewable Area)	(H x V)	Approx. 19 1/8 x 12 inches (Approx. 483.8 x 302.4 mm)	Approx. 14 1/2 x 8 1/8 inches (Approx. 366 x 206 mm)
	(Diagonal)	22 1/2 inches (570.6 mm)	Approx. 16 1/2 inches (419 mm)
Aspect		16:10	16:9
Resolution (H x V)		1920 x 1200 pixels (WUXGA)	1920 x 1080 pixels
Pixel Efficiency		99.99 %	99.99 %
Backlight		High-purity LEDs	High-purity LEDs
Preset Brightness		100 cd/m² (D-Cine: 48 cd/m²) (when 100 % white signal is input)	100 cd/m² (D-Cine: 48 cd/m²) (when 100 % white signal is input)
Panel drive		RGB 10 bit	RGB 10 bit
Panel frame rate		96/100/120 Hz	96/100/120 Hz
Viewing angle		85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)
INPUT/OUTPUT			
Video Input/Output		Four (4) slots	Four (4) slots
PC Input		DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)
HDMI		HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)
Control	LAN	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)
	Parallel Remote	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)
	Option A	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)
	Option B	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)
DC 5V Out		Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)
GENERAL			
Power Requirements		100 V to 240 V AC, 2.0 to 0.9 A, 50/60 Hz	100 V to 240 V AC, 1.5 A to 0.7 A, 50/60 Hz, or DC 24V to 28V, 5.4 A to 4.6 A
Power consumption		Approx. 180 W (at maximum load, the luminance compensation due to the aged deterioration of the LED is included.)	Approx. 130 W (AC), Approx. 120 W (DC) (at maximum load, the luminance compensation due to the aged deterioration of the LED is included.)
Operating Temperature		32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity		0 % to 90 % (no condensation)	0 % to 90 % (no condensation)
Operating Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa
Storage and Trans. Temperature		-4 °F to +140 °F (-20 °C to +60 °C)	-4 °F to +140 °F (-20 °C to +60 °C)
Storage and Trans. Humidity		0 % to 90 %	0 % to 90 %
Storage and Trans. Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa
Dimensions (W x H x D)		22 3/8 x 17 1/4 x 9 5/8 inches (565.5 x 436.4 x 243.1 mm)	17 1/4 x 10 1/2 x 11 inches (436 x 265.8 x 278.6 mm)
Weight		Approx. 46 lb 5 oz (21 kg)	Approx. 30 lb 14 oz (14 kg)
Supplied Accessories		AC power cord (1), AC plug holder (1), Cable holder (1), Bracket (1), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Rack mount bracket (Left, right, each 1), Rack mount attachment screws (6), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)

		PVM-L3200	PVM-L2300	PVM-L1700
PICTURE PERFORMANCE				
Type		α-Si TFT Active Matrix LCD	α-Si TFT Active Matrix LCD	α-Si TFT Active Matrix LCD
Picture Size (Viewable Area)	(H x V)	27 1/2 x 15 1/2 inches (698.4 x 392.85 mm)	19 1/8 x 12 inches (483.8 x 302.4 mm)	14 1/2 x 8 1/8 inches (365.8 x 205.7 mm)
	(Diagonal)	31 5/8 inches (801.3 mm)	22 1/2 inches (570.6 mm)	16 1/2 inches (419 mm)
Aspect		16:9	16:10	16:9
Resolution (H x V)		1920 x 1080 pixels	1920 x 1200 pixels (WUXGA)	1920 x 1080 pixels
Pixel Efficiency		99.99%	99.99%	99.99%
Backlight		Wide Color Gamut CCFL	Wide Color Gamut CCFL	Wide Color Gamut CCFL
Preset Brightness		100 cd/m² (when 100 % white signal is input)	100 cd/m² (when 100 % white signal is input)	100 cd/m² (when 100 % white signal is input)
Panel drive		RGB 10 bit	RGB 10 bit	RGB 10 bit
Panel frame rate		96/100/120 Hz	96/100/120 Hz	96/100/120 Hz
Viewing angle		85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)	85°/85°/85°/85° (typical) (up/down/left/right contrast > 10:1)
INPUT/OUTPUT				
Video Input/Output		Four (4) slots	Four (4) slots	Four (4) slots
PC Input		DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)	DVI-D (x1) (HDCP correspondence)
HDMI		HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)	HDMI (x1) (HDCP correspondence, Deep color correspondence)
Control	LAN	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)	Ethernet (10 BASE-T/100 BASE-TX), RJ-45 (x1)
	Parallel Remote	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)	D-sub 9-pin (female) (x1)
	Option A	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)	Mini-DIN 8-pin (female) (x1)
	Option B	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)	USB (Type A) (x1) (used for future expansion)
DC 5V Out		Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)	Circle 4-pin (female) (x1)
GENERAL				
Power Requirements		100 V to 240 V AC, 1.9 A to 0.8 A, 50/60 Hz	100 V to 240 V AC, 1.4 A to 0.6 A, 50/60 Hz	100 V to 240 V AC, 1.2 A to 0.5 A, 50/60 Hz, or DC 24 V to 28 V, 4.6 A to 4.0 A
Power consumption		Approx. 170 W (at maximum load) Approx. 90 W (with 1 x BKM-243HS)	Approx. 140 W (at maximum load) Approx. 80 W (with 1 x BKM-243HS)	Approx. 110 W (AC), Approx. 100 W (DC) (at maximum load) Approx. 90 W (AC), Approx. 80 W (DC) (with 1 x BKM-243HS)
Operating Temperature		32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity		0 % to 90 % (no condensation)	0 % to 90 % (no condensation)	0 % to 90 % (no condensation)
Operating Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa	700 hPa to 1060 hPa
Storage and Trans. Temperature		-4 °F to +140 °F (-20 °C to +60 °C)	-4 °F to +140 °F (-20 °C to +60 °C)	-4 °F to +140 °F (-20 °C to +60 °C)
Storage and Trans. Humidity		0 % to 90 %	0 % to 90 %	0 % to 90 %
Storage and Trans. Pressure		700 hPa to 1060 hPa	700 hPa to 1060 hPa	700 hPa to 1060 hPa
Dimensions (W x H x D)		31 3/8 x 22 x 9 5/8 inches (794.0 x 556.7 x 243.1 mm)	22 3/8 x 17 1/4 x 9 5/8 inches (565.5 x 435.2 x 243.1 mm)	17 1/4 x 10 1/2 x 11 inches (436 x 265.8 x 278.6 mm)
Weight		Approx. 59 lb 8 oz (27 kg)	Approx. 35 lb 4 oz (16 kg)	Approx. 24 lb 4 oz (11 kg)
Supplied Accessories		AC power cord (1), AC plug holder (1), Bracket (1), Connection Cable for Color Temperature Probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Bracket (1), Connection cable for color temperature probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)	AC power cord (1), AC plug holder (1), Bracket (1), Connection cable for color temperature probe (1), Operation Manual (Japanese, English, each 1), CD-ROM (1), Using the CD-ROM Manual (1)

BKM-250TG

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital component signals Sampling frequency 3G-SDI: Y/Cb/Cr: 148.5 MHz/74.25 MHz/74.25 MHz, G/B/R: 148.5 MHz/148.5 MHz/148.5 MHz HD-SDI: Y/Cb/Cr: 74.25 MHz/37.125 MHz/37.125 MHz, SD-SDI: Y/Cb/Cr: 13.5 MHz/6.75 MHz/6.75 MHz
Monitor Out	BNC (x2), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	3G-SDI: 70 m (approx. 230 ft) max. (When using 5C-FB coaxial cables (Fujikura. Inc.) or equivalent.) HD-SDI: 100 m (approx. 328 ft) max. (When using 5C-FB coaxial cables (Fujikura. Inc.) or equivalent.) SD-SDI:200 m (approx. 656 ft) max. (When using 5C-2V coaxial cables (Fujikura. Inc.) or equivalent.)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Optimum temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-4 °F to 140 °F (-20 °C to +60 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 9.5 oz (270 g)
Supplied Accessories	Operating Instructions (1)

BKM-243HS

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: SD-SDI: Y/R-Y/B-Y: 13.5 MHz, HD-SDI: Y/Pb/Pr: 74.25 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	SD-SDI: 200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent) HD-SDI: 100 m (approx. 328 ft) max. (when using 5C-FB coaxial cables (Fujikura) or equivalent)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 2 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-4 °F to 140 °F (-20 °C to 40 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 9 oz (250 g)
Supplied Accessories	Operating Instructions (1)

BKM-227W

INPUT/OUTPUT	
Composite Input	BNC (x1), 1 Vp-p ± 3 dB sync negative
Y/C Input	Mini DIN 4-pin (x1) Y: 1 Vp-p ± 3 dB sync negative C: 0.286 Vp-p ± 3 dB (NTSC burst signal level), 0.3 Vp-p ± 3 dB (PAL, PAL-M burst signal level)
Monitor Out	BNC (x1), Loop-through, with 75 Ω automatic termination Mini DIN 4-pin (x1), Loop-through, with 75 Ω automatic termination
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 1.8 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-4 °F to 140 °F (-20 °C to 60 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 8 oz (240 g)
Supplied Accessories	Operating Instructions (1)

BKM-244CC

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: SD-SDI: Y/R-Y/B-Y: 13.5 MHz, HD-SDI: Y/Pb/Pr: 74.25 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ± 10 % Output impedance: 75 Ω unbalanced
Transmission Distance	SD-SDI: 200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent) HD-SDI: 100 m (approx. 328 ft) max. (when using 5C-FB coaxial cables (Fujikura) or equivalent)
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	0 °C to 35 °C (32 °F to 95 °F) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	14 °F to 104 °F (-10 °C to 40 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 9 oz (250 g)
Supplied Accessories	Operating Instructions (1)

BKM-229X

INPUT/OUTPUT	
BNC (x3)	RGB Input 0.7 Vp-p ± 3 dB (Sync on Green, 0.3 Vp-p sync negative)
	Component Input 0.7 Vp-p ± 3 dB
External Sync Input	BNC (x1), 0.3 to 4 Vp-p ± bipolarity ternary or negative polarity binary
	Mini DIN 4-pin (x1), Loop-through, with 75 Ω automatic termination
GENERAL	
Voltage	+3.3 V, +5 V (supplied from the main unit)
Power Consumption	Approx. 4 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-4 °F to 140 °F (-20 °C to 60 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 9 oz (250 g)
Supplied Accessories	Operating Instructions (1)

BKM-220D

INPUT/OUTPUT	
Serial Digital Interface	BNC (x2), Digital Component Signals Sampling Frequency: Y/R-Y/B-Y: 13.5 MHz Quantization: 10 bits/sample
Monitor Out	BNC (x1), Output signal amplitude: 800 mVp-p ±10 % Output impedance: 75 Ω unbalanced
Transmission Distance	200 m (approx. 656 ft) max. (when using 5C-2V coaxial calbes (Fujikura) or equivalent)
GENERAL	
Voltage	+5 V (supplied from the main unit)
Power Consumption	Approx. 1.5 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Recommended operation temperature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	-4 °F to 140 °F (-20 °C to 60 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	4 x 13/16 x 6 1/2 inches (100 x 20 x 162 mm)
Weight	Approx. 9 oz (250 g)
Supplied Accessories	Operating Instructions (1)

BKM-16R

INPUT/OUTPUT	
LAN	10BASE-T/100BASE-TX connector: RJ-45 x 1
DC 5V/12V IN	Circle 4-pin (male) (x1)
GENERAL	
Power Requirements	DC IN: 5 V, 1.1 A (supplied by the connected monitor) DC IN: 12 V, 0.5 A (supplied by the connected AC adaptor) AC adaptor: AC IN: 100 to 240 V, 50/60 Hz, DC OUT: 12 V, 3 A
Current Consumption	5 V DC, 1.1 A/12 V DC, 0.5 A
Power Consumption	Approx. 6 W
Operating Temperature	32 °F to 95 °F (0 °C to 35 °C) (Recommended operating temprature 68 °F to 86 °F (20 °C to 30 °C))
Operating Humidity	0 % to 90 % (no condensation)
Operating Pressure	700 hPa to 1060 hPa
Storage and Trans. Temperature	14 °F to 104 °F (-10 °C to + 40 °C)
Storage and Trans. Humidity	0 % to 90 %
Storage and Trans. Pressure	700 hPa to 1060 hPa
Dimensions (W x H x D)	16 3/4 x 2 3/8 x 7 inches (424 x 58.8 x 174.9 mm)
Weight	Approx. 4 lb 10 oz (2.1 kg)
Supplied Accessories	AC adaptor (1), AC power cord (parts number: 1-757-562-1x1 for USA and Canada, 1-575-131-8x for Europe) (1), Rack mount brackets (2), Rack mount attachment screws (4), Function labels (2), Operation manual (1)

Optional Accessories

BKM-16R
Monitor Control Unit

BKM-250TG
3G/HD/SD-SDI Input Adaptor

BKM-244CC
HD/SD-SDI Closed Caption Adaptor

BKM-243HS
HD-SDI/SD-SDI Input Adaptor

BKM-220D
SD-SDI 4:2:2 Input Adaptor

BKM-229X
Analog Component Adaptor

BKM-227W
NTSC/PAL Input Adaptor

BKM-23M
Protection Panel*
(for BVM-L231 and PVM-L2300)

BKM-37H
Controller Attachment Stand
(for BVM-L231 and PVM-L2300)
*Tilt Function

BKM-38H
Controller Attachment Stand
(for PVM-L2300)

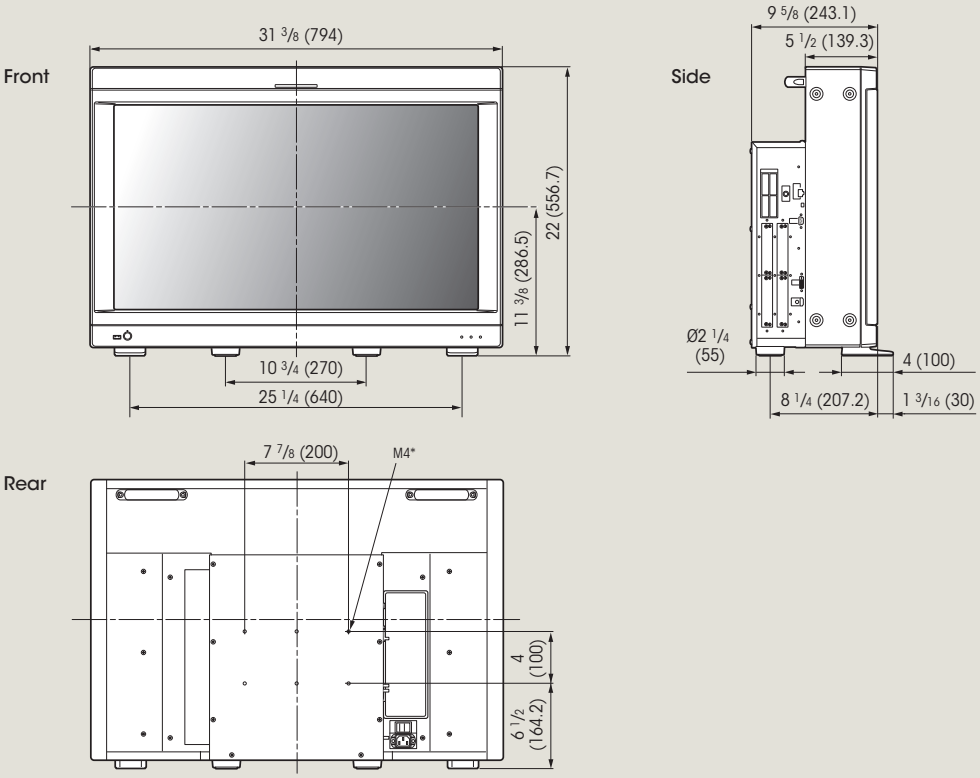
BKM-39H
Controller Attachment Stand
(for BVM-L170 and PVM-L1700)

SMF-700
Monitor Interface Cable

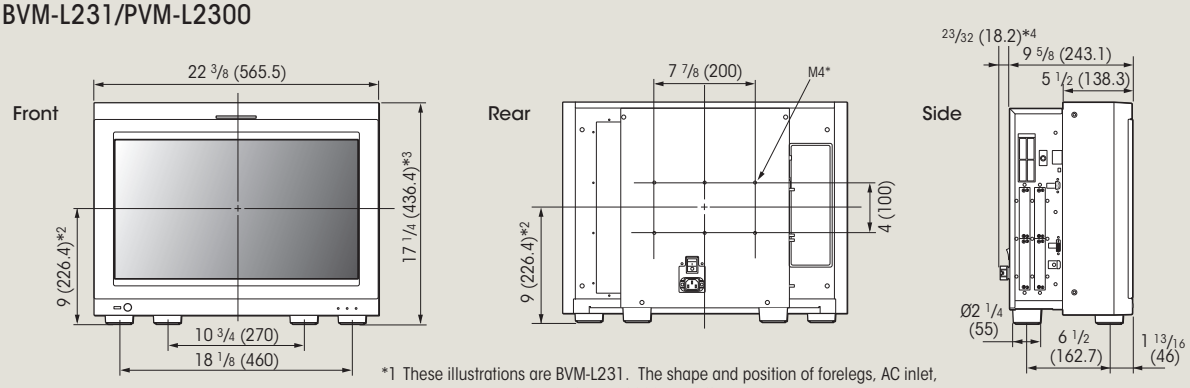
*BVM-L170, PVM-L3200, and PVM-L1700 equipped with a standard protection panel.

Dimensions

PVM-L3200



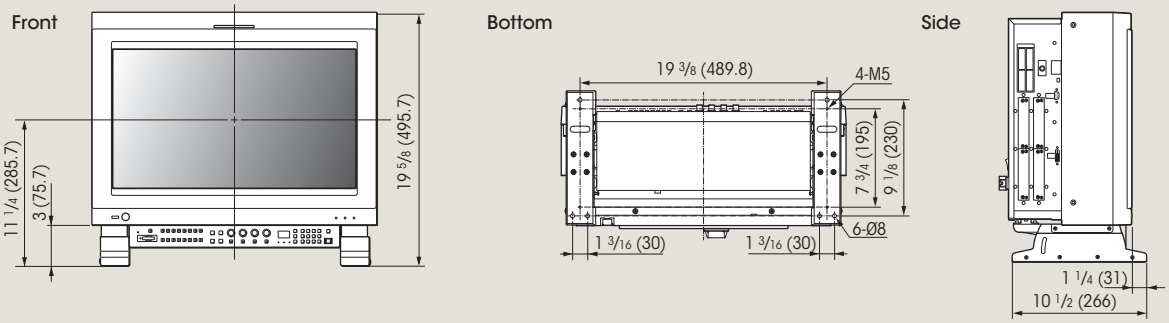
BVM-L231/PVM-L2300



*1 These illustrations are BVM-L231. The shape and position of forelegs, AC inlet, and main power switch of PVM-L2300 are different.

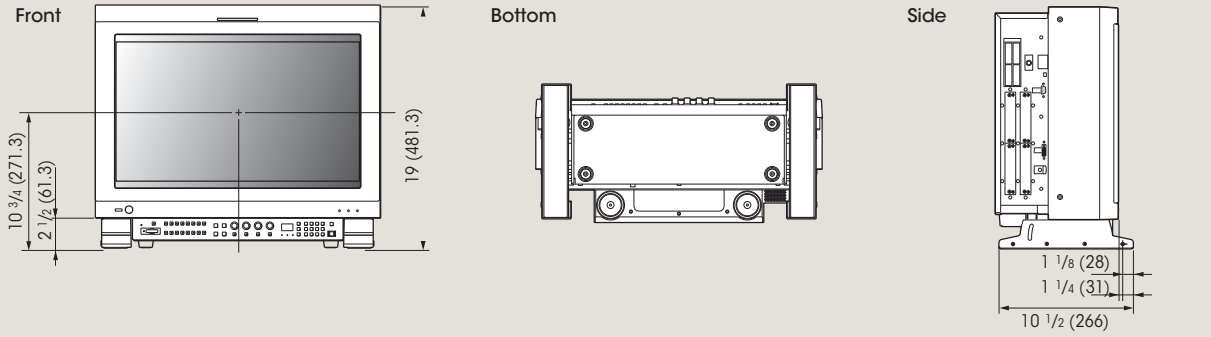
*2 PVM-L2300: 225.2 (8 7/8) *3 PVM-L2300: 435.2 (17 1/4) *4 BVM-L231 only has this part.

BVM-L231 with the optional BKM-16R and BKM-37H with a tilt.

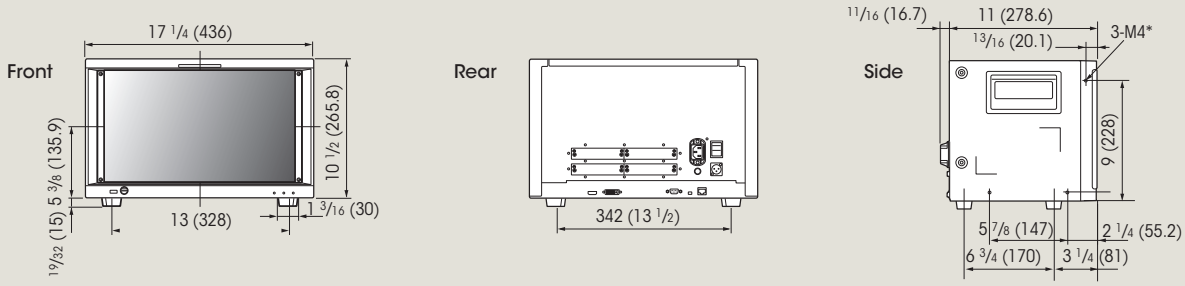


Unit : inch(mm)

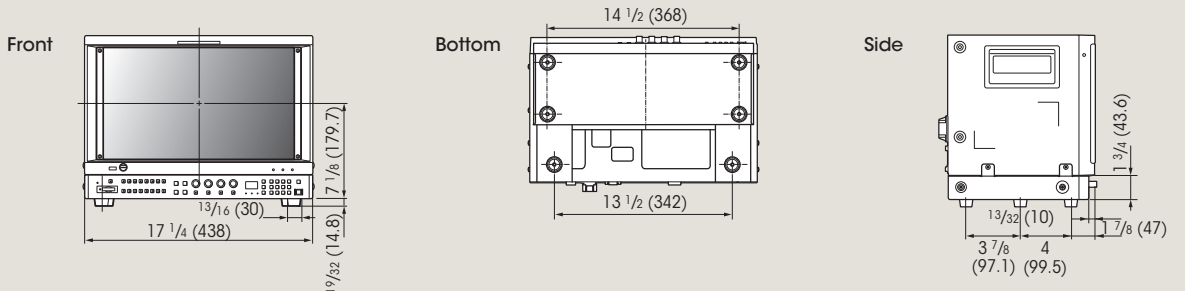
PVM-L2300 with the optional BKM-16R and BKM-38H



BVM-L170/PVM-L1700

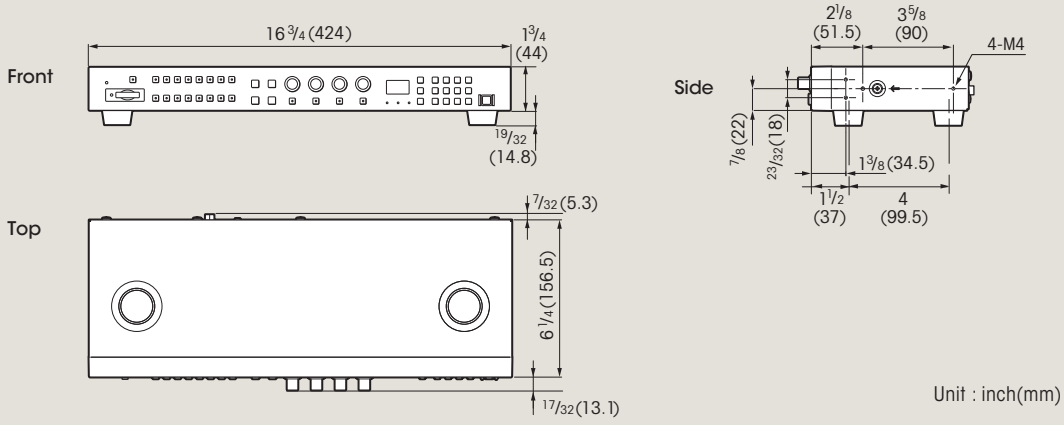


BVM-L170/PVM-L1700 with an optional BKM-16R and BKM-39H



Unit : inch(mm)

BVM-16R



Unit : inch(mm)

SONY

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The BVM-L231, BVM-L170, PVM-L3200, PVM-L2300, and PVM-L1700 are produced at Sony EMCS Corporation Inazawa Tec, which has received ISO14001 the Environmental Management system certification.

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DI-0196 (MK10642V1)

Printed in USA (5/10)